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FOSSIL MAMMALS FROM THE BEGINNING OF THE CENOZOIC IN BRAZIL

NOTOUNGULATA

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INTRODUCTION

This is one of several preliminary reports on the fossil mammals from the Paleocene (Itaboraian) of São José de Itaboraí, Brazil. The other reports deal with Polydolopidae, Borhyaenidae, and Didelphidae of the Marsupialia (Paula Couto, 1952a, 1952b), and the Condylarthra, Litopterna, Astrapotheria, and a new order of primitive South American ungulates (Paula Couto, in press). A detailed study of the complete collection, with statistical analyses, will be published later by the Museu Nacional, in collaboration with the Divisão de Geologia e Mineralogia do Departamento Nacional da Produção Mineral, Rio de Janeiro. Inasmuch as this detailed study will not be forthcoming for some time, it was decided that preliminary reports be published, in order to make information on this important fauna available as early as possible.

The fossils came from a marl which fills channels and underground caves in a limestone quarry in São José de Itaboraí, State of Rio de Janeiro, several miles northeast of Niterói, the capital of that state, and in about the same latitude as the city of Rio de Janeiro, Brazil. The quarry is under the management of the Companhia Nacional de Cimento Portland (Mauá) which, besides granting permission to collect fossils in the quarry, gave generous help to my work. I am grateful to Mr. Kerrys Aptho-

¹ Museu Nacional, Rio de Janeiro, Brazil.

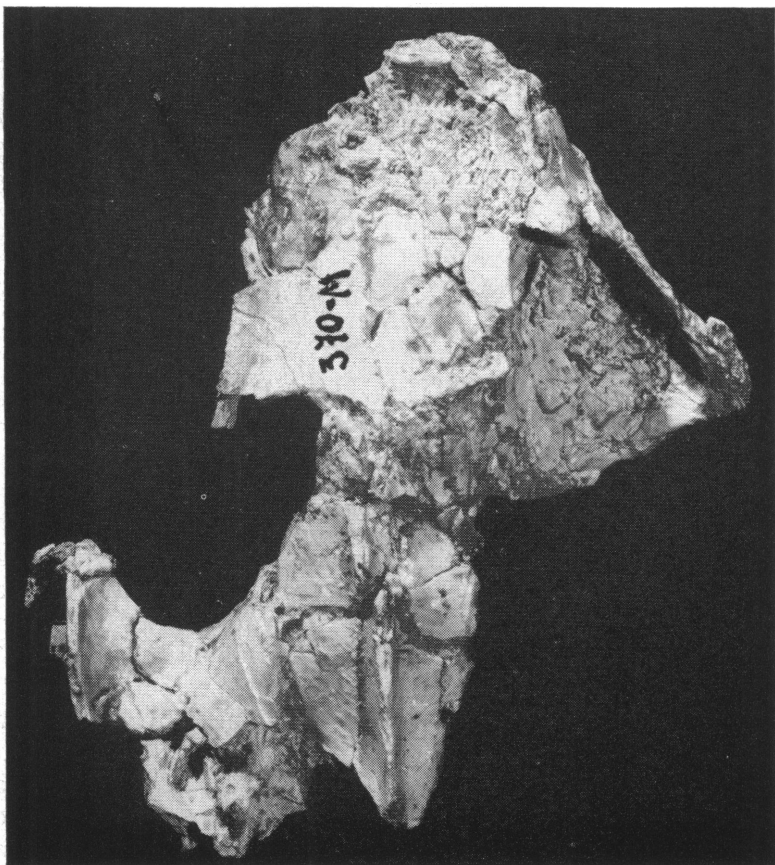


FIG. 1. *Colbertia magellanica* (Price and Paula Couto, 1950). D.G.M. No. 370-M, fragmentary skull, top view. $\times 1\frac{1}{2}$.

masi, president of the company, and to various employees at the quarry of São José de Itaboraí, for their cooperation.

The value of these studies of the Itaboraian collection was increased by the opportunity of direct comparison with specimens of the lower Eocene Patagonian collection in the American Museum of Natural History. This was made possible by a generous grant given me by the John Simon Guggenheim Memorial Foundation, to which I extend my most sincere thanks.

Special acknowledgments are due to Dr. George Gaylord Simpson for his constructive criticism of my manuscript and for the

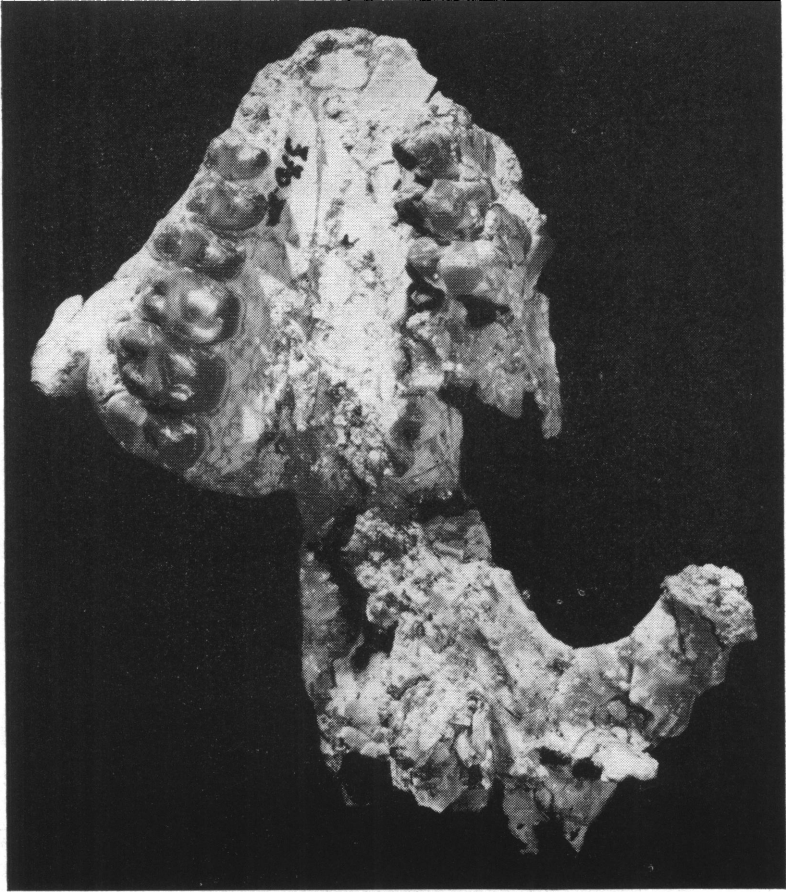


FIG. 2. *Colbertia magellanica* (Price and Paula Couto, 1950). D.G.M. No. 370-M, fragmentary skull, palatal view. $\times 1\frac{1}{2}$.

loan of his still unpublished manuscript on the Notoungulata-Typotheria from Patagonia, which greatly facilitated the study of the Itaboraian representatives of this group.

I am grateful to the American Museum of Natural History for all the facilities placed at my disposal and for the publication of my papers. Much valuable assistance was given me by members of the Department of Geology and Paleontology, the Osborn and General Libraries, and the Division of Photography, and to all of these friends I present my most sincere thanks.

ORDER NOTOUNGULATA ROTH, 1903
SUBORDER TYPOTHERIA ZITTEL, 1892
FAMILY **OLDFIELDTHOMASIIDAE** SIMPSON, 1945
COLBERTIA, NEW GENUS¹

GENOTYPE: *Colbertia magellanica* (Price and Paula Couto, 1950).

DIAGNOSIS: Similar to, but more primitive than, *Maxschlosseria*. P^2-4 and M^{1-3} relatively much more transverse. Paracone and metacone folds strong on M^{1-3} , the metacone fold slightly weaker. Protocone more conspicuous and bunoid. M^{1-3} with main fossa relatively wider. Lower dentition almost indistinguishable from that of *Maxschlosseria*, but talonid of molars somewhat longer, with broader basin, and entoconid separated farther from metaconid.

REMARKS: *Colbertia* presents the ideal ancestral features of *Maxschlosseria* and can be considered the Paleocene ancestor of this lower Eocene genus.

Colbertia magellanica (Price and Paula Couto, 1950),
new combination

Henricosbornia magellanica PRICE AND PAULA COUTO, 1950, p. 154.

HOLOTYPE: D.G.M. No. 152-M. Isolated left M^3 .

PARATYPE: D.G.M. No. 153-M. Fragment of left lower jaw with P_3-M_1 present.

REFERRED SPECIMENS: M.N.R.J. Nos. 1865-V to 1909-V and 1944-V to 1977-V, partial right and left lower jaws with cheek teeth; Nos. 1910-V to 1925-V, fragmentary left and right maxillae with cheek teeth; Nos. 1926-V and 1927-V, series of associated left and right P^2-M^3 and P^2-M^2 , respectively; Nos. 1928-V to 1943-V, isolated right and left upper cheek teeth; Nos. 1978-V to 1987-V, isolated right and left lower cheek teeth; all collected by Carlos de Paula Couto, 1948-1949. D.G.M. Nos. 236-M, 242-M, 252-M, 254-M, 256-M to 259-M, 264-M to 266-M, 269-M, 272-M, 274-M to 276-M, 279-M to 283-M, 285-M and 286-M, 289-M, 291-M, 293-M, 295-M, 298-M and 299-M, 316-M, 322-M, 377-M to 382-M, incomplete right and left lower jaws with cheek teeth; No. 310-M, almost complete mandible with right P_2 , P_4-M_3 , and left P_2-M_3 (cast A.M.N.H. No. 49852);

¹ In honor of Dr. Edwin Harris Colbert.

Nos. 284-M, 288-M, 302-M, 306-M, 357-M, 372-M to 376-M, partial right and left maxillae with cheek teeth; Nos. 370-M and 371-M, fragmentary skulls with right P^2-M^3 and left P^2-4 , and right P^1-M^3 and left P^4-M^3 , respectively; all collected by Júlio da Silva Carvalho, 1949. A.M.N.H. Nos. 49840, 49867 to 49877, incomplete right and left maxillae with cheek teeth; Nos. 49841 to 49846, 49864 to 49866, 49878 to 49890, partial right and left lower jaws with cheek teeth; all collected by Carlos de Paula Couto, 1948.

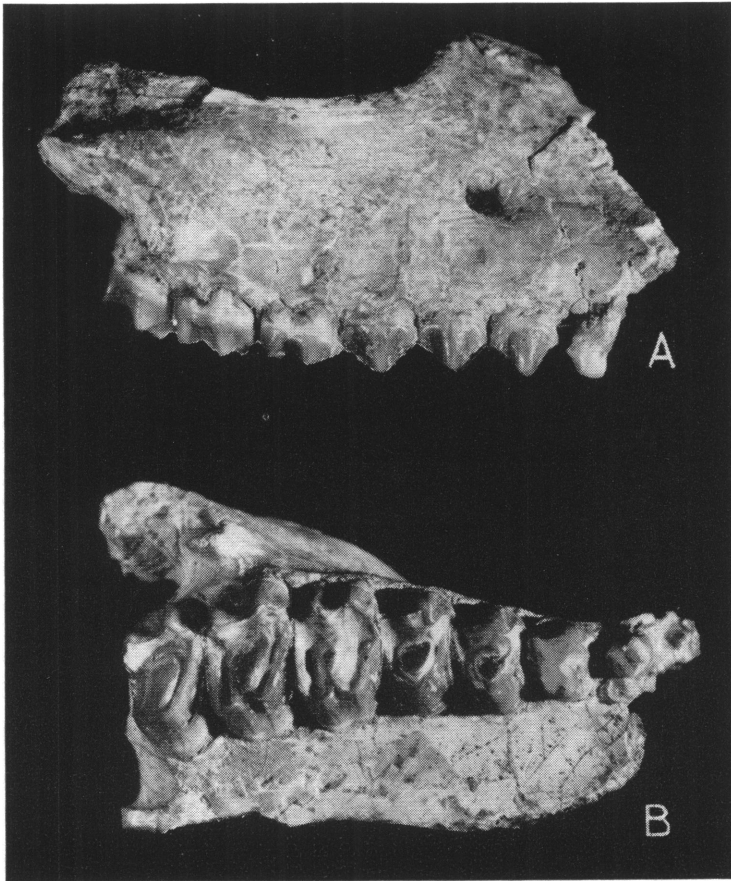


FIG. 3. *Colbertia magellanica* (Price and Paula Couto, 1950). D.G.M. No. 371-M, partial right maxilla with P^1-4 , M^1-3 . A. External side view. B. Palatal view. $\times 2$.

TABLE 1
MEASUREMENTS (IN MILLIMETERS) OF THE UPPER CHEEK TEETH OF *Colbertia magellanica*

	P ¹		P ²		P ³		P ⁴		M ¹		M ²		M ³	
	L	W	L	W	L	W	L	W	L	W	L	W	L	W
D.G.M. No. 152-M, type	—	—	—	—	—	—	—	—	—	—	—	—	5.9	8
D.G.M. No. 370-M	—	—	—	5.2	4.8	7	—	8.1	5.9	9.2	6.9	9.9	5.8	8.3
D.G.M. No. 371-M	3	2.5	4.8	5.4	4.9	7	5	8	5.7	8.8	6.8	9	6.2	9
M.N.R.J. No. 1910-V	3.9	2.9	5.9	5.8	5.3	7	5.6	9	7.8	10.1	8.5	11.4	7.2	10.6
M.N.R.J. No. 1911-V	—	—	5	5.8	5	7.2	5.1	8.1	6.1	9.1	7.2	10.2	7	9.5
M.N.R.J. No. 1927-V	—	—	4.9	5.2	5.4	7.1	5.4	9.1	7.5	10	8	11	—	—
A.M.N.H. No. 49873	—	—	—	—	5.1	7	5.3	8.5	6.3	9.1	8.1	10.9	7.5	10.2
A.M.N.H. No. 49867	—	—	—	—	—	—	—	—	8	9.6	9	11.4	—	—
A.M.N.H. No. 49871	—	—	—	—	—	—	—	—	6.7	8.8	7	10	6.2	9.6
M.N.R.J. No. 1912-V	—	—	4.5	5.2	4.8	6.7	5	7.7	6.1	8	7	9.2	7	8.9
D.G.M. No. 357-M	3	2	4	4.9	4.5	6.2	4.9	7.2	6.3	7.9	7	8.8	6.9	8.8
M.N.R.J. No. 1919-V	—	—	—	—	—	—	5	7.1	6	7.2	7.1	8.8	6.1	8.9
M.N.R.J. No. 1913-V	—	—	—	—	4.8	6	5	7	6	7.7	7	9	6.2	8.5
D.G.M. No. 280-M	—	—	—	—	4.7	6.8	4.9	7.4	6	7.4	7	9.2	6	7.6
M.N.R.J. No. 1914-V	—	—	4	4.2	4.2	5.6	4.2	6.4	6	7	6.6	7.5	—	—
M.N.R.J. No. 1926-V	—	—	4.2	5	4.3	6.2	4.3	7.5	5.2	8	6	9.1	5.5	8.2
A.M.N.H. No. 49868	—	—	—	—	—	—	4.3	6.9	6.3	8.8	6.6	9	—	—

TABLE 2

MEASUREMENTS (IN MILLIMETERS) OF THE LOWER CHEEK TEETH OF *Colbertia magellanica*

	P ₁		P ₂		P ₃		P ₄		M ₁		M ₂		M ₃	
	L	W	L	W	L	W	L	W	L	W	L	W	L	W
D.G.M. No. 153-M, paratype	—	—	—	—	4.5	3.1	5	3.6	5.9	4	—	—	—	—
D.G.M. No. 310-M	—	—	3.9	2.5	4.9	3	5.1	3.6	6.3	4	7	4.8	7.3	4.1
M.N.R.J. No. 1871-V	—	—	3.9	2.8	4.8	3.1	5	3.4	6	4	6.9	4.4	8.8	4.8
M.N.R.J. No. 1870-V	—	—	—	—	4.8	3.2	5.4	3.8	6	4	6.9	4.6	9	4.6 ^a
A.M.N.H. No. 49878	—	—	4	2.9	4.9	3.2	5.2	3.5	6	3.9	6.5	4.7	8	5
A.M.N.H. No. 49841	—	—	—	—	—	—	5	4	6	4.7	6.5	5.4	8	5.1
A.M.N.H. No. 49846	—	—	—	—	—	—	4.4	3.4	5	4	5.9	4.8	8	4.8
D.G.M. No. 264-M	—	—	—	—	5.1	3.5	5	3.8	6.6	4.2	7.1	5	8.2	4.8
D.G.M. No. 265-M	—	—	—	—	5	3.5	5.5	4	5.5	4.2	6.5	5	8.5	4.5
D.G.M. No. 242-M	—	—	3.6 ^a	2.5	4	3.1	4.3	3.5	5.1	3.9	5.9	4.3	—	—
M.N.R.J. No. 1893-V	—	—	—	—	—	—	4.7	3.7	5.7	4	6	4.7	7	4.2
D.G.M. No. 266-M	2.5	1.5	4	2.3	4.8	3	4.7	3.4	4.6	3.4	—	—	—	—
A.M.N.H. No. 49845	—	—	—	—	4.5	3.4	5	3.8	6	4	6.9	4.8	—	—
M.N.R.J. No. 1907-V	—	—	—	—	—	—	—	—	5.9	4.6	6	4.1	7.5	4.1
A.M.N.H. No. 49879	—	—	—	—	5.1	3.8	5.4	4.6	6.1	5	7.6	5.8	9	5.5
A.M.N.H. No. 49881	—	—	—	—	—	—	—	—	6.3	4.8	7.5	5.5	9.1	5.7
M.N.R.J. No. 1890-V	—	—	—	—	—	—	5.5	3.9	6.9	5	7.3	5	9	5.3
M.N.R.J. No. 1900-V	—	—	—	—	—	—	—	—	—	—	8	6	9.5	5.9
D.G.M. No. 269-M	—	—	—	—	5.6	4	6.3	5	7.6	5.2	8	6	10.3	5.9

^a Approximate.

DIAGNOSIS: The only known species of the genus. Measurements of the types and of some of the referred specimens are given in tables 1 and 2.

DISCUSSION: This is one of the most common genera and species in the Paleocene (Itaboraian) fauna of São José de Itaboraí.

There is great variation in size among the specimens attributed to this species, as is shown by the measurements in tables 1 and 2. This variation may, however, be considered as indicative of sexual and age differences, since the morphology is almost exactly the same in all the specimens, and the coefficient of variation of the proportions does not go beyond the limits of individual variation of a single species.

Very little is known of the skull, the specimen D.G.M. No. 370-M being the best preserved. This specimen is very incom-

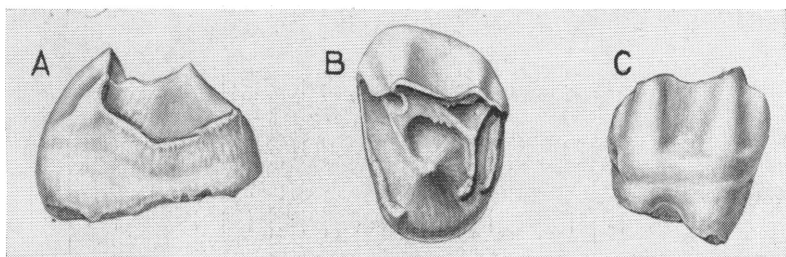


FIG. 4. *Colbertia magellanica* (Price and Paula Couto, 1950). D.G.M. No. 152-M, left M^3 , type. A. Front view. B. Crown view. C. External view. $\times 3$. From Price and Paula Couto, 1950.

plete, crushed, and deformed. Another specimen, D.G.M. No. 371-M, is less crushed, but more incomplete. (See figs. 1-3.)

The skull is similar to that of *Oldfieldthomasia* in its known parts.

The infraorbital canal extends above P^3-4 , and the foramen is placed above P^3 . The base of the zygoma is opposite M^{2-3} . The sagittal crest is, however, stronger and resembles that of *Noto-stylops murinus*. It follows the parietals, along the midline, for their entire length.

The mandible, which is known from the almost complete specimen D.G.M. No. 310-M, and a number of partial jaws, is also very similar to that of *Oldfieldthomasia*. The description below is based mostly on the better specimen.

The horizontal ramus is almost as slender as that of *Oldfieldthomasia*. The symphysis extends back to the side of P_3 . It is

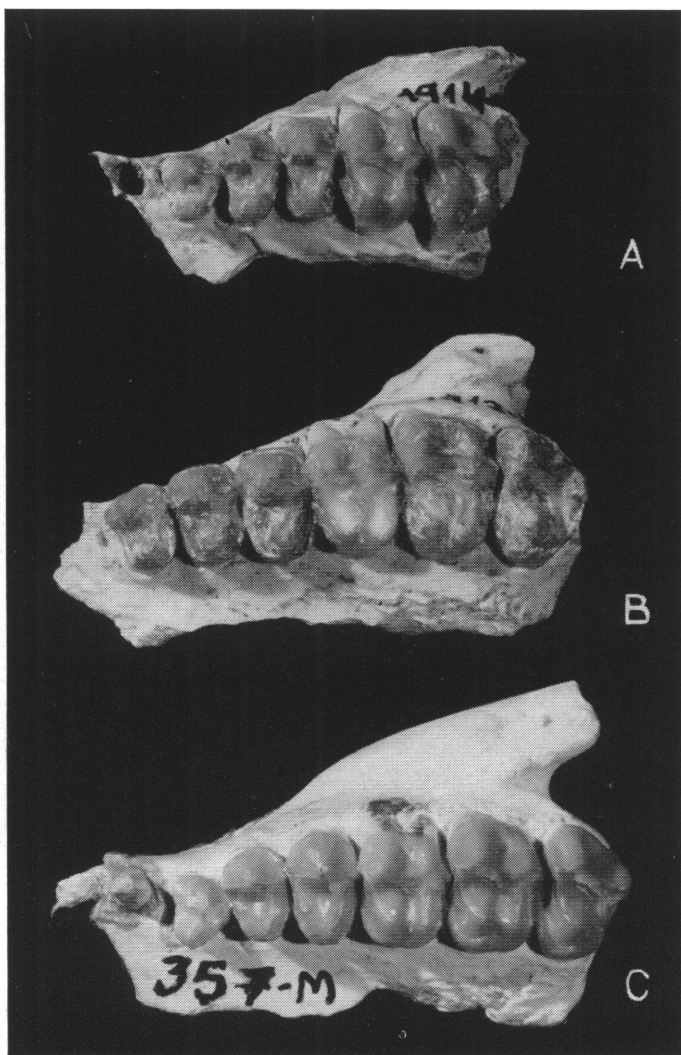


FIG. 5. *Colbertia magellanica* (Price and Paula Couto, 1950). Left upper premolars and molars, crown view. A. M.N.R.J. No. 1914-V, P^2-M^2 . B. M.N.R.J. No. 1912-V, P^2-M^3 . C. D.G.M. No. 357-M, P^1-M^3 . $\times 2$.

shallow and stronger and more oblique anteroposteriorly than in *Oldfieldthomasia*. As in this genus, the number of mental fo-

ramina is irregular and highly variable. Three foramina, at least, are present; the anterior foramen is generally beneath P_1 , the posteriormost usually under P_4 or M_1 . The posterior opening of the dental canal is large and similar in morphology and position to

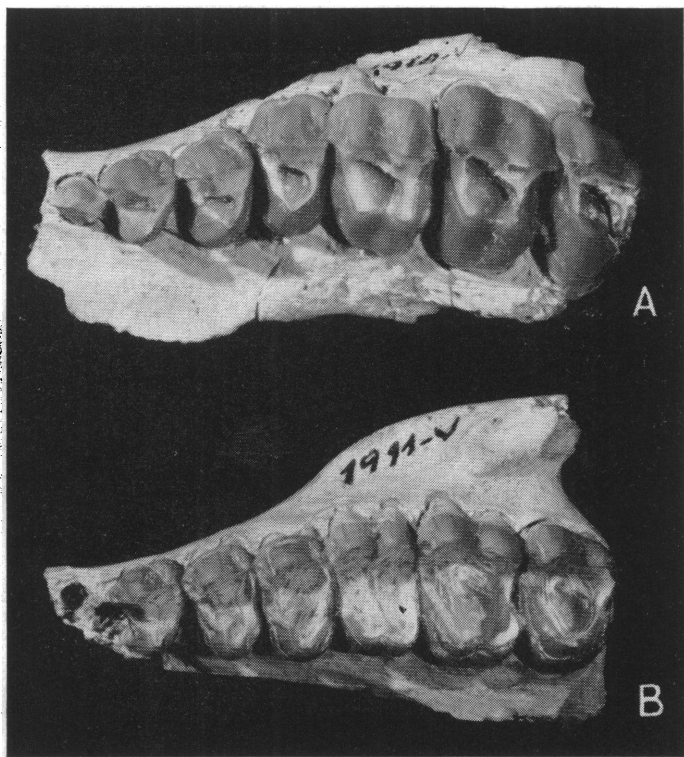


FIG. 6. *Colbertia magellanica* (Price and Paula Couto, 1950). Left upper premolars and molars, crown view. A. M.N.R.J. No. 1910-V, P^1 - M^3 . B. M.N.R.J. No. 1911-V, P^2 - M^3 . $\times 2$.

that of *Oldfieldthomasia*. The condyle is placed well above the dental level. The coronoid, which is not preserved, seems to have been short anteroposteriorly and slightly above the level of the condyle. The angular region is broad, thin, well rounded posteriorly, and projects slightly below the lower border of the horizontal ramus, as in *Oldfieldthomasia*.

The dentition seems to have been complete and in closed series, excepting small diastemata sometimes present between the canines

and the first premolar and between the first and the second premolars.

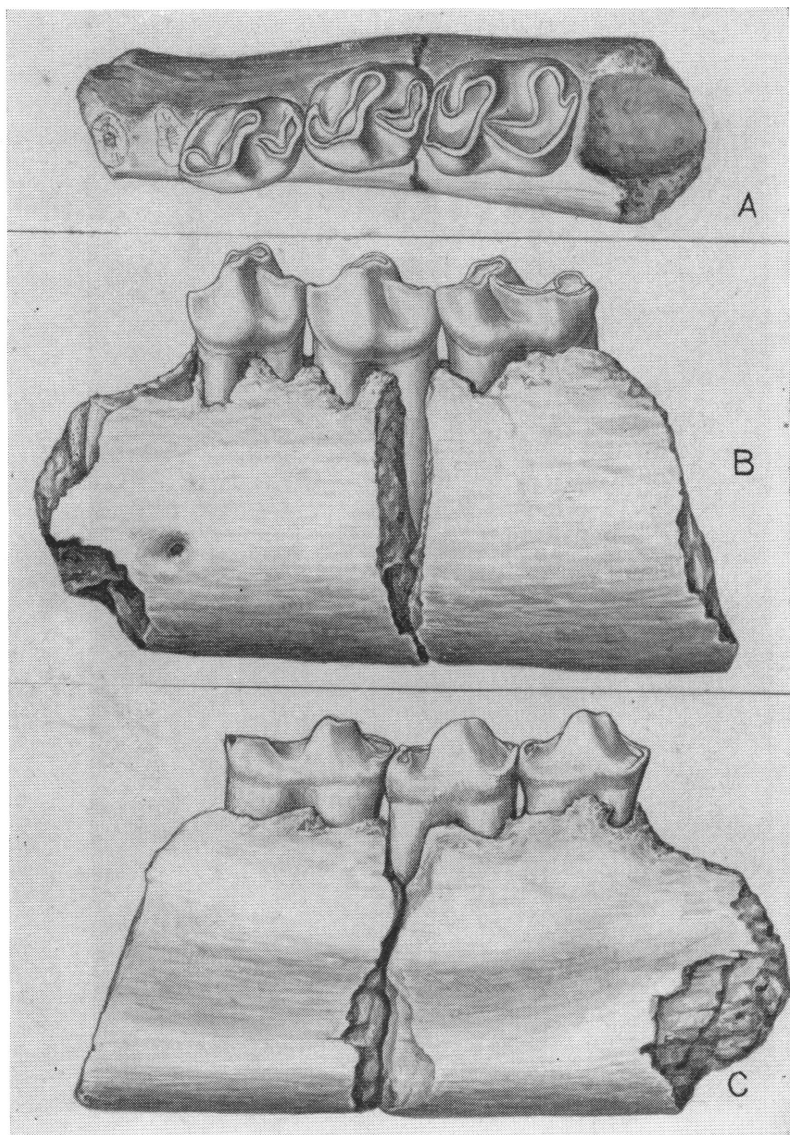


FIG. 7. *Colbertia magellanica* (Price and Paula Couto, 1950). D.G.M. No. 153-M, fragment of left lower jaw with P_3 - M_1 , paratype. $\times 3$. From Price and Paula Couto, 1950.



FIG. 8. *Colbertia magellanica* (Price and Paula Couto, 1950). D.G.M. No. 310-M, left ramus of lower jaw, external view, partially restored. $\times 2$.

The incisors and upper canines are not preserved.

The cheek teeth are low-crowned. P^1 is very small, compressed transversely, longer than wide. It bears a simple ectoloph, tri-

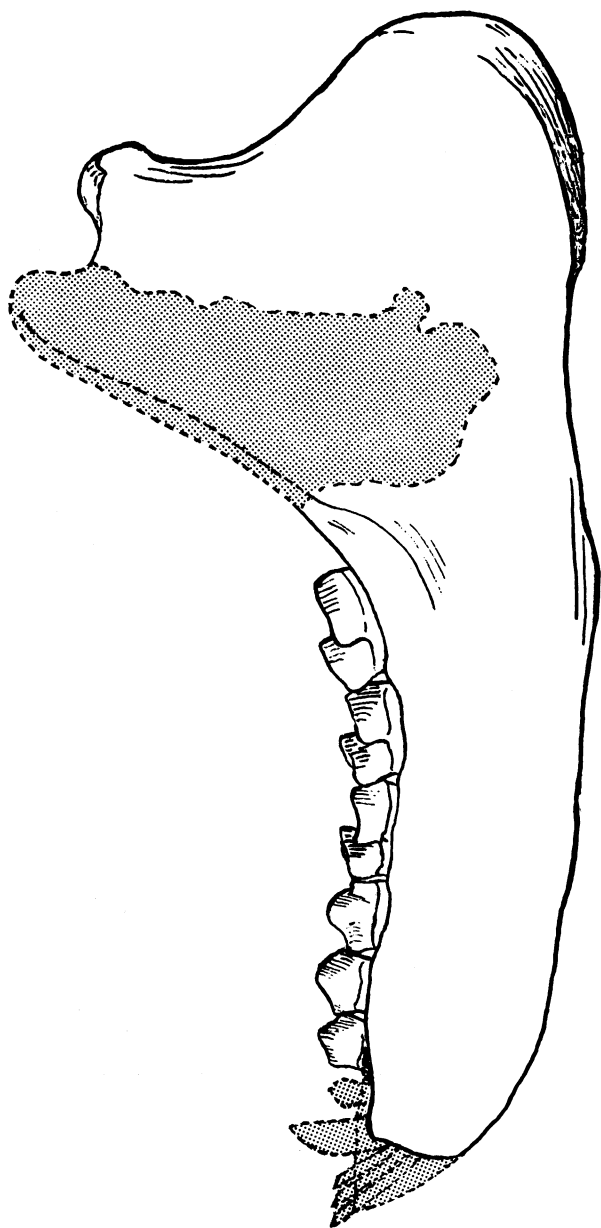


FIG. 9. *Colbertia magellanica* (Price and Paula Couto, 1950). D.G.M. No. 310-M, the same specimen as in figure 8, completely restored. $\times 2$.

angular in outline, and a vestigial, basal protocone or hypocone, placed slightly posterior to the mid-length of the tooth. P^{2-3} are rounded-triangular in outline, wider than long. Their ecto-

lophs present strong, mesial metacone folds and distinct parastylar and metastylar folds. The protocone is absent on P^2 , but it is present, but vestigial and isolated, on the middle part of the anterior face of P^3 . The hypocone¹ is very strong, rounded, bunoid, separated from the ectoloph by a shallow, transverse, internal basin, but connected with the metastyle by a weak, depressed metaloph. A rudimentary protoloph is sometimes present between the anteromesial, minute protocone and the parastyle, especially on P^3 . There are no discernible traces of the antero- and postero-external fossettes on P^2 , these fossettes sometimes being vestigial on P^3 , the antero-external fossette not closed. P^4 is similar to P^{2-3} , but it is less triangular and somewhat quadrangular in outline, anteroposteriorly compressed, and much wider than long. Its metacone and parastylar folds are stronger, the latter being very sharp. The antero- and postero-external fossettes are also vestigial but sometimes quite definite. The anterior and posterior transverse crest (protoloph and metaloph) tend to meet inwardly on the top of the strong meso-internal cusp (hypocone), in a V-shaped figure (some specimens have these crests parallel, the anterior one being much weaker and shorter than the posterior). P^{2-4} have anterior and posterior cingula, more or less strong.

The upper molars look like those of *Maxschlosseria* in their general features. They are, however, much more transverse, relatively, than those of *Maxschlosseria*. The main fossa is broader, and the protocone is larger and bunoid, its inner part being inflated. The metacone fold is strong on all the molars, almost as strong as the paracone fold on M^1 , weaker on M^{2-3} . The metaloph is relatively more prolonged inwardly. The last upper molar, especially, is much more transverse than that of *Maxschlosseria*. It is roughly rounded-triangular in outline, instead of quadrangular. Its protocone is stronger, conical, much more expanded, and its metaloph is transverse, instead of oblique. All the upper molars have well-developed antero- and postero-external fossettes, and more or less strong, simple, anterior and posterior basal cingula, the posterior cingulum usually wider than the anterior, and

¹ It seems to me that the strong, meso-internal cusp in the premolars of this group is properly the hypocone, not the protocone, since it is connected with the metastyle by a posterior, transverse crest, an anterior transverse one being sometimes present, connecting a very small anteromesial cusp (which may be the small protocone) with the parastyle.

lower than in *Maxschlosseria*, with either a vestigial, or no, fossa.

The lower dentition is almost indistinguishable from that of *Maxschlosseria*.

The incisors are not preserved. The canine is known from the specimen D.G.M. No. 266-M, a partial right lower jaw which

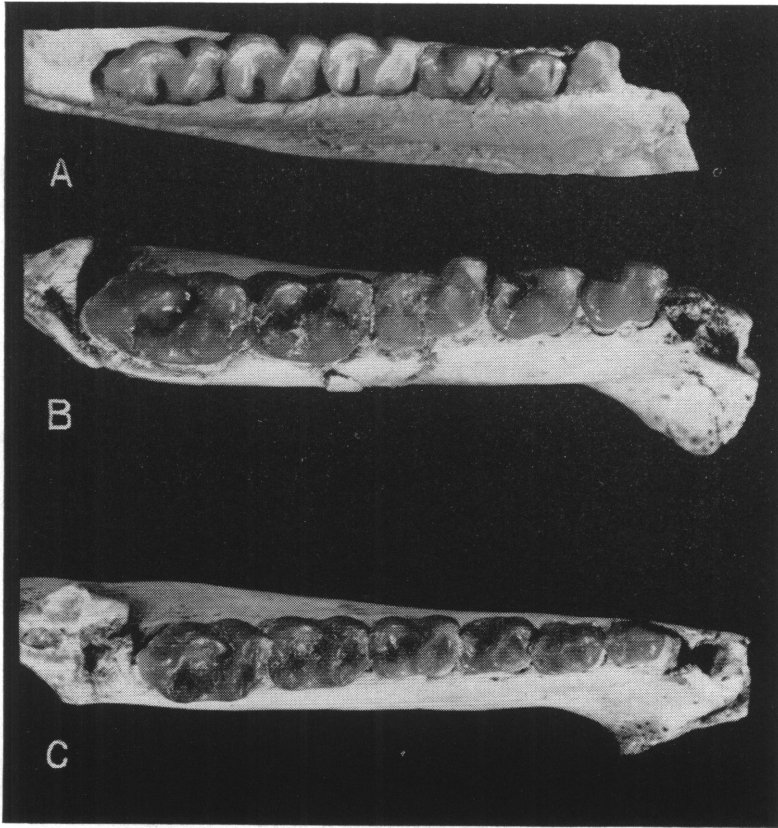


FIG. 10. *Colbertia magellanica* (Price and Paula Couto, 1950). Left lower premolars and molars, crown view. A. D.G.M. No. 310-M, P_2 - M_3 . B. D.G.M. No. 269-M, P_3 - M_3 . C. M.N.R.J. No. 1871-V, P_2 - M_3 . $\times 2$.

seems to belong to a young individual. The canine is small and simple, slightly procumbent, and looks like P_1 in its general shape and size. Another specimen, M.N.R.J. No. 1870-V, an incomplete mandible from an adult individual, shows the partial alveoli of the right and left lower canines which, judging by the size of the

alveoli, were certainly stronger than the one described above, and almost twice as large as P_1 .

The lower cheek teeth are generally of the same pattern as in *Maxschlosseria*. The talonid of P_4 is relatively narrower and shorter, this tooth being less molariform than in the Casamayoran genus. The talonid of the molars is, however, relatively a little longer and almost as broad as in *Maxschlosseria*, its basin being much wider, although shallower. As a result of the lengthening of the talonid, the entoconid is more posterior, more separated from the metaconid than in *Maxschlosseria*. The hypoconid is crescentic, rather than slightly angular.

Among the specimens from São José de Itaborai there are an incomplete left maxilla and several fragments of right and left lower jaws of very young individuals, with deciduous or milk teeth present. In the fragment of left maxilla M.N.R.J. No. 1918-V, the DM^{2-4} are well preserved. DM^{2-3} are distinguishable from P^{2-3} only by their smaller size and by the fact that they are relatively narrower, i.e., less expanded inwardly. DM^4 is a perfect miniature of M^1 .

The specimen D.G.M. No. 258-M, a left lower jaw of a very young individual, has DM_{2-4} and M_1 preserved, and the specimen M.N.R.J. No. 1868-V, a median fragment of right lower jaw, has DM_4 and M_1 in use. The milk cheek teeth are elongate, relatively narrower than the permanent ones. DM_{2-3} are similar to P_{3-4} , and DM_4 is perfectly molariform, but it is lower than, and about three-quarters as wide as, M_1 .

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